

WHAT IS CLAIMED IS:

1                   1.       A computer program product for populating a database with  
2 manipulated biological information, said computer program product comprising:  
3                   code for providing a plurality of cells in various stages of the cell cycle,  
4 said stages of the cell cycle including at least one selected from interphase, G0 phase, G1  
5 phase, S phase, G2 phase, M phase, prophase, prometaphase, metaphase, anaphase, and  
6 telophase;  
7                   code for manipulating said cells in said various stages of cell cycle  
8 development to form a plurality of manipulated cells;  
9                   code for capturing an image of said plurality of manipulated cells;  
10                  code for determining a descriptor from said image for said manipulated  
11 cells;  
12                  code for populating a database with said descriptor;  
13                  wherein said image includes a first component of a cell and a second  
14 component of said cell; and  
15                  a computer readable storage medium for holding the codes.

1                   2.       The computer program product of claim 1 wherein said first  
2 component and said second component are selected from a protein, a protein  
3 modification, a nucleic acid, a lipid, a carbohydrate, a sub-cellular structure and an  
4 organelle.

1                   3.       The computer program product of claim 1 wherein said image is a  
2 digitized representation of said plurality of manipulated cells.

1                   4.       The computer program product of claim 3 wherein said digitized  
2 representation provides a density value of said plurality of manipulated cells.

1                   5.       The computer program product of claim 1 wherein said descriptors  
2 comprise numeric or logical values.

1                   6.       The computer program product of claim 5 wherein said values  
2 further comprises a nucleotide.

1 6. The computer program product of claim 5 wherein said values  
2 further comprises an amino acid letter.

1 8. A computer program product for determining a property of a  
2 manipulation based upon effects of said manipulation on at least two of a plurality of  
3 components of at least one of a plurality of cells, said computer program product  
4 comprising:  
5 code for providing at least one of a plurality of samples of said  
6 manipulation to said at least one of a plurality of cells;  
7 code for determining at least one of a plurality of features of said at least  
8 two of a plurality of components of at least one of a plurality of cells in the presence of  
9 said manipulation;  
10 code for determining at least one of a plurality of descriptors, said  
11 descriptors comprising at least one of said plurality of features;  
12 code for searching a plurality of descriptors obtained from a database to  
13 locate descriptors based upon one of said descriptors of said manipulation, said searching  
14 forming a plurality of located descriptors;  
15 code for determining, based upon said located descriptors, properties of  
16 said manipulation based upon said located descriptors;  
17 wherein said two of a plurality of components includes a first component  
18 and a second component of a cell, said code for determining at least one of a plurality of  
19 descriptors of a state comprises code for combining information about said first  
20 component and said second component; and  
21 a computer readable storage medium for holding the codes.

1 9. The computer program product of claim 8 wherein said plurality of  
2 components are selected from a protein, a protein modification, a nucleic acid, a lipid, a  
3 carbohydrate, a sub-cellular structure and an organelle.

1 10. The computer program product of claim 8 wherein said code for  
2 determining said plurality of located descriptors further comprises code for determining a  
3 plurality of matching descriptors, said matching descriptors corresponding to a prior  
4 administration of said manipulation, said prior administration of said manipulation having  
5 at least one of a plurality of properties.

1 11. The computer program product of claim 8 wherein said code for  
2 providing a manipulation comprises code for applying a chemical factor.

1 12. The computer program product of claim 8 wherein said code for  
2 providing a manipulation comprises code for applying a biological factor.

1 13. The computer program product of claim 8 wherein said code for  
2 providing a manipulation comprises code for applying an electromagnetic factor.

1 14. The computer program product of claim 8 wherein said code for  
2 providing a manipulation comprises code for applying a gravitational factor.

1 15. The computer program product of claim 8 wherein said code for  
2 providing a manipulation comprises code for applying a mechanical factor.

1 16. The computer program product of claim 8 wherein said code for  
2 providing a manipulation comprises code for applying a thermal factor.

1 17. The computer program product of claim 8 wherein said  
2 manipulation comprises a temporal factor.

1 18. The computer program product of claim 8 wherein said code for  
2 providing a manipulation comprises code for applying a nuclear factor.

1 19. The computer program product of claim 8 wherein said properties  
2 comprises toxicity.

1 20. The computer program product of claim 8 wherein said properties  
2 comprises specificity against a subset of tumors.

1 21. The computer program product of claim 8 wherein said properties  
2 comprises a mechanism of chemical activity.

1 22. The computer program product of claim 8 wherein said properties  
2 comprises a mechanism of biological activity.

1 23. The computer program product of claim 8 wherein said properties  
2 comprises a target protein.

1                    24.    The computer program product of claim 8 wherein said properties  
2 comprises a mechanism of action.

1                    25.    The computer program product of claim 8 wherein said properties  
2 comprises a structure.

1                    26.    The computer program product of claim 8 wherein said properties  
2 comprises at least one of a plurality of adverse biological effects.

1                    27.    The computer program product of claim 8 wherein said properties  
2 comprises at least one of a plurality of biological pathways.

1                   28.     The computer program product of claim 8 wherein said properties  
2 comprises at least one of a plurality of adverse clinical effects.

1                    29.    The computer program product of claim 8 wherein said properties  
2 comprises at least one of a plurality of cellular availability.

1                    30.     The computer program product of claim 8 wherein said properties  
2 comprises at least one of a plurality of pharmacological properties.

1                    31.    The computer program product of claim 8 wherein said properties  
2 comprises a gene expression profile.

1                    32.     The computer program product of claim 30 wherein said  
2     pharmacological properties comprises absorption.

1                    33.     The computer program product of claim 30 wherein said  
2     pharmacological properties comprises excretion.

1                    34.     The computer program product of claim 30 wherein said  
2     pharmacological properties comprises distribution.

1                    35.     The computer program product of claim 30 wherein said  
2     pharmacological properties comprises metabolism.

1                    36.     The computer program product of claim 8 wherein said properties  
2 comprises pharmacodynamic properties.

1 37. The computer program product of claim 8 wherein said properties  
2 can be selected from clinical uses and indications, human and veterinary diagnostic uses  
3 and tests, or human and veterinary prognostic uses and tests..

1 38. The computer program product of claim 8 wherein said descriptor  
2 comprises a scalar.

1 39. The computer program product of claim 8 wherein said descriptor  
2 comprises a vector.

1 40. A computer program product of mapping a manipulation of cells  
2 based upon a morphological value, said computer program product comprising:  
3 code for capturing a morphological value from said plurality of cells said  
4 cells being manipulated;  
5 code for assigning a degree of presence of said morphological value; and  
6 code for storing said morphological value and said degree of presence;  
7 wherein said morphological value is derived from a first component of a  
8 cell and a second component of said cell, said code for capturing said morphometric value  
9 from said plurality of cells comprises code for determining a relationship between said  
10 first component and said second component; and  
11 a computer readable storage medium for holding the codes.

1 41. The computer program product of claim 40 wherein said first  
2 component and said second component are selected from a protein, a protein  
3 modification, a nucleic acid, a lipid, a carbohydrate, a subcellular structure and an  
4 organelle.

1 42. The computer program product of claim 40 wherein said  
2 manipulation occurs in a manner selected from a electrical source, a chemical source, a  
3 thermal source, a gravitational source, a nuclear source, a temporal source, and a  
4 biological source.

1 43. The computer program product of claim 42 wherein said chemical  
2 source is selected from a pharmacological candidate and a drug screening library.

1 44. The computer program product of claim 40 wherein said  
2 morphological value is selected from a count, an area, a perimeter, a length, a breadth, a  
3 fiber length, a fiber breadth, a shape factor, a elliptical form factor, an inner radius, an  
4 outer radius, a mean radius, an equivalent radius, an equivalent sphere volume, an  
5 equivalent prolate volume, an equivalent oblate volume, an equivalent sphere surface  
6 area, an average gray value, a total gray value, and an optical density.

SUB  
A6 } 1 45. The computer program product of claim 40 wherein said degree of  
2 presence is multiple of a quantized value.

1 46. A computer program product of predicting properties of an  
2 unknown compound based upon information about effects of at least one of a plurality of  
3 known compounds on a first cell population, said computer program product comprising:  
4 code for populating a database with descriptors for known compounds,  
5 wherein said descriptors are determined from imaging said first cell population;  
6 code for determining descriptors for cells subjected to the unknown  
7 compound, wherein said descriptors are determined from imaging a second cell  
8 population;  
9 code for determining a relationship between said descriptors of said  
10 unknown compound with said descriptors of said known compounds;  
11 code for making an inference about said unknown compound based upon  
12 said descriptors of said known compounds; and  
13 a computer readable storage medium for holding the codes.

1 47. The computer program product of claim 46 wherein said code for  
2 determining descriptors comprises code for determining a relationship between said first  
3 component and said second component.

1 48. The computer program product of claim 47 w herein said first  
2 component and said second component are selected from a protein, a protein  
3 modification, a nucleic acid, a lipid, a carbohydrate, a sub-cellular structure and an  
4 organelle.